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SUBMITTED OR TRANSMITTED IN COMPLIANCE WITH RULE 17.1(a) OR (b)

Application No.	S980415
Date of Filing	3 June, 1998
Applicant	ALLIANCE INVESTMENTS LIMITED, an Irish Company of Monksland Industrial Estate, Athlone, County Westmeath, Ireland.

Dated this 11th day of June 1999.

An officer authorised by the
Controller of Patents, Designs and Trademarks.

PP

S980415

FORM NO. 1

REQUEST FOR THE GRANT OF A PATENT

PATENTS ACT 1992

The Applicant(s) named herein hereby request(s)
[ ] the grant of a patent under Part II of the Act
[X] the grant of a short-term patent under Part III of the Act
on the basis of the information furnished hereunder.

1. Applicant(s)

ALLIANCE INVESTMENTS LIMITED,
Monksland Industrial Estate
Athlone
County Westmeath
Ireland
an Irish Company

2. Title of Invention
A therapeutic bed

3. Declaration of Priority on basis of previously filed application(s) for same invention (Sections 25 & 26)

Previous Filing Date	Country in or for which filed	Filing No.

4. Identification of Inventor(s)

Name(s) and addresse(s) of person(s) believed by the Applicant(s) to be the inventor(s)
Patrick Joseph Connolly
an Irish Citizen of Lissoy, The Pigeons, Athlone, County Westmeath, Ireland

S980415

5. Statement of right to be granted a patent (Section 17(2) (b))

6. Items accompanying this Request

(i)	[X]	prescribed filing fee (IRP 50)
(ii)	[ ]	specification containing a description and claims
	[X]	specification containing a description only
	[X]	Drawings referred to in description or claims
(iii)	[ ]	An abstract
(iv)	[ ]	Copy of previous application(s) whose priority is claimed
(v)	[ ]	Translation of previous application whose priority is claimed
(vi)	[X]	Authorisation of Agent (this may be given at 8 below if this Request is signed by the Applicant(s))

7. Divisional Application(s)
The following information is applicable to the present application which is made under Section 24 -

Earlier Application No.
Filing Date:

8. Agent

The following is authorised to act as agent in all proceedings connected with the obtaining of a patent to which this request relates and in relation to any patent granted -

Name & Address

Cruickshank & Co. at their address recorded for the time being in the Register of Patent Agents is hereby appointed Agents and address for service, presently 1 Holles Street, Dublin 2.

9. Address for service (if different from that at 8)

Signed Cruickshank & Co.

By:- C. Schmitt Executive.

Agents for the Applicant

Date June 03, 1998.

"A Therapeutic Bed"

This invention relates to a therapeutic bed, and in particular to prone positioning beds.

According to the invention there is provided a therapeutic bed comprising a base frame, a patient support platform rotatably mounted on the base frame for rotation about a longitudinal axis of the patient support platform.

Preferably the patient support platform is rotatable through substantially 180° to support a patient in either a supine or a prone position.

In a further embodiment retaining means is provided for securing the patient on the platform.

Conveniently the retaining means is operably connected to the means for rotating the patient support platform to only permit rotation to a prone position in response to correct operation of the retaining means. Thus advantageously the patient support platform cannot be rotated into the prone position without the necessary restraints being correctly operated to securely retain the patient at the patient support platform.

In a particularly preferred embodiment the therapeutic bed incorporates a tube management system or optimum handling of tubes and monitoring cables passing between the patient and associated equipment externally of the bed. Preferably the tube management system comprises a tube guide means provided for guiding the tubes away from the patient support platform, said tube guide means being mounted at one or both ends of the patient support platform at or adjacent the longitudinal rotational axis of the patient support platform.

The invention will be more clearly understood by the following description of some embodiments thereof, given by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a therapeutic bed according to the invention;

Fig. 2 is a perspective view of a base portion of the bed with a patient support platform of the bed removed;

Fig. 3 is a perspective view of the bed in use and supporting a patient in a supine position;

Fig. 4 is a perspective view of the bed in use, supporting a patient in a prone position;

Fig. 5 is a detail sectional elevational view of a side rail locking mechanism for the bed;

Fig. 6 is a sectional elevational view of a panel locking mechanism on the patient support platform;

Fig. 7 is an enlarged detail sectional view of portion of the locking mechanism of Fig. 6;

Fig. 8 is a view similar to Fig. 7 showing the locking mechanism in another position of use;

Fig. 9 is a perspective of a patient retaining strap and buckle forming portion of the bed;

Fig. 10 is a perspective view of a tube guide at one end of the bed;

Fig. 11 is a detail side elevational view of a rotary encoder forming portion of the bed; and

Fig. 12 is a detail view showing a disc portion of the rotary encoder.

Referring to the drawings there is illustrated a therapeutic bed according to the invention indicated generally by the reference numeral 1. The bed 1 comprises a ground engaging chassis 2 mounted on wheels 3. A base frame 4 is secured on the chassis 2 by pivot linkages 5. Rams 6 at each end of the base frame 4 extend between the base frame 4 and the chassis 2 to raise and lower the base frame 4 on the chassis 2. The rams 6 may be operated to keep the base frame 4 level as it rises or may be operated to raise or lower one of the ends of the base frame 4 to tilt the base frame 4 about a transverse axis of the base frame 4 to move a patient support platform 7 carried on the base frame 4 into a Trendelenburg position. The patient support platform 7 is rotatably mounted on the base frame 4 for rotation about a longitudinal axis of the patient support platform 7 between a supine support position shown in Fig. 3 and a prone support position shown in Fig. 4.

The patient support platform 7 has a pair of end rings 8,9 which rotatably engage associated rollers 10 at each end of the base frame 4. Side support bars 12,13 extend between the end rings 8,9. A central cross bar 14 extends between the side support bars 12,13. Hinged panels 16,17 are hingedly connected to the cross bar 14 and can be opened when the bed is in the prone position illustrated in Fig. 4 for access to the back of the patient. A slap shut mechanism 20 (Figs. 6 to 8) is mounted on each panel 16,17 at a free edge of the panel for engagement with the

support bars 12,13 to securely lock the panels 16,17 in the closed position. A spring loaded pin 22 is mounted within a housing 23 for movement between a retracted stored position (Fig. 7) and an extended position (Fig. 8) in which the locking pin 22 engages in an associated slot in the support bars 12,13.

At each side of the patient support platform 7 upstanding side rails 25 are provided, each side rail has a downwardly extending stanchion 26 at each end which is engagable with a complementary socket 27 in one of the support bars 12,13. Upon engagement of the stanchion 26 with the socket 27 a spring loaded pin 28 is engagable through a wall socket 27 with a locking slot 29 in the stanchion 26. A handle 30 at an inner of the locking pin 28 is operable to slide the locking pin 28 in an associated housing 31 for release of the stanchion 26. However it will be noted that an associated retaining pin 32 is mounted on the housing 31 such that when the patient support platform 7 is in the inverted position the pin 32 drops downwardly to prevent retraction of the pin 28. A sensor 35 is engagable with the pin 28 to determine the position of the pin 28. All of the sensors 35 are connected in series and are connected to a controller for a motor which rotates the patient support platform such that the motor will not operate until all the sensors 35 indicate that the pins 28 are properly engaged with the stanchions 26 so that the rails 25 are securely attached to the patient support platform 7. Associated pairs of patient support flaps 40,41 are mounted on opposite side rails 25 and can be secured together by locking straps 43 to securely retain a patient on the patient support platform 7 as described in our previous patent application Publication No. WO97/22323 (the details of which are incorporated by reference). Each strap 43 comprises a web 44 with either a buckle 45 or associated clip (not shown)

at a free end of the web. The web 44 when the buckle 45 is released is shortened by an elastic 46 to withdraw the buckle 45 from over a magnetically operated switch mounted on the flaps 40,41. Thus when the buckle is in the engaged position the magnetically operated switch is operable to confirm that the buckles are correctly joined and the patient is thus secured on the patient support platform 7.

Tube management means for tubes and sensor cables is provided on the bed. At a foot end of the bed the tube management means comprises a central opening 50 adjacent a longitudinal axis of the patient support platform 7 for supporting and through passage of the tubes. At a head end of the bed the tube management means comprises a support and guide 51 mounted adjacent the longitudinal axis of the patient support platform 7 and slidable on associated rails 52 so that it drops beneath the head of the patient when the bed is in either the supine or the prone position. It will be appreciated that this tube management by leading the tubes axially outwardly at each end of the bed gratefully facilitates handling of the tubes when moving the patient support platform between the supine and support position.

A drive for the patient support platform can be of the type described in our WO97/22323 (the details of which are incorporated by reference). In this case however a rotary opto encoder comprising a code ring 60 with three tracks of slots 61,62,63. An outer track 61 comprises slots at 1° intervals. An intermediate track 62 has slots to provide index identification and an inner track 63 as slots in line with the lock ring park position. As the patient support platform 7 rotates the spaces between the slots interrupt infra-red beams passing between emitters 65 and receivers 66 on a support 67. Information from the

infra-red detectors is processed by an optical processing controller to provide the angle of the patient support platform 7.

In use, sensors associated with the side rails and the panels on the patient support platform are connected to the drive controller for the patient support platform such that the patient support platform cannot be rotated unless the locks are correctly engaged. Further the sensors on the straps of the patient retaining straps also need to indicate correct engagement before the patient support platform can be rotated. It will also be appreciated that the delivery of the tubes axially outwardly at each end of the patient support platform greatly facilitates tube management during movement of the bed between the supine and prone positions.

The invention is not limited to the embodiments hereinbefore described which may be varied in both construction and detail.

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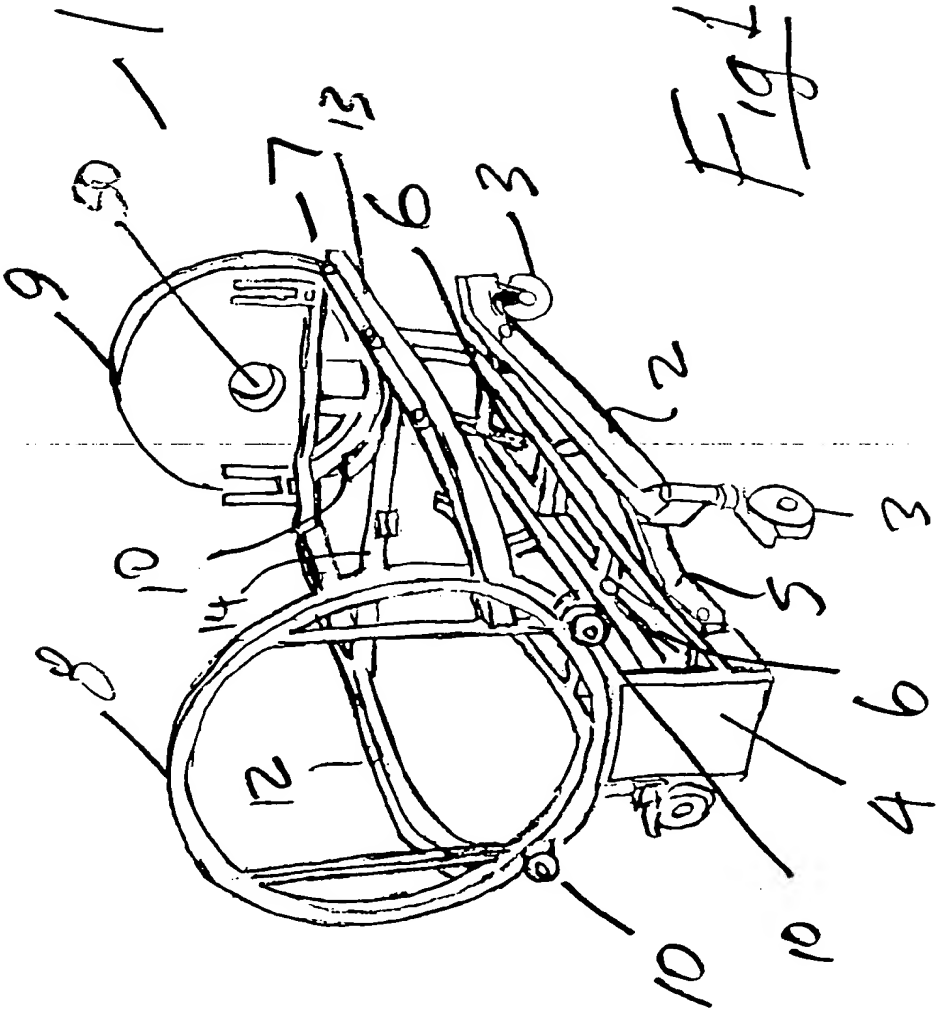
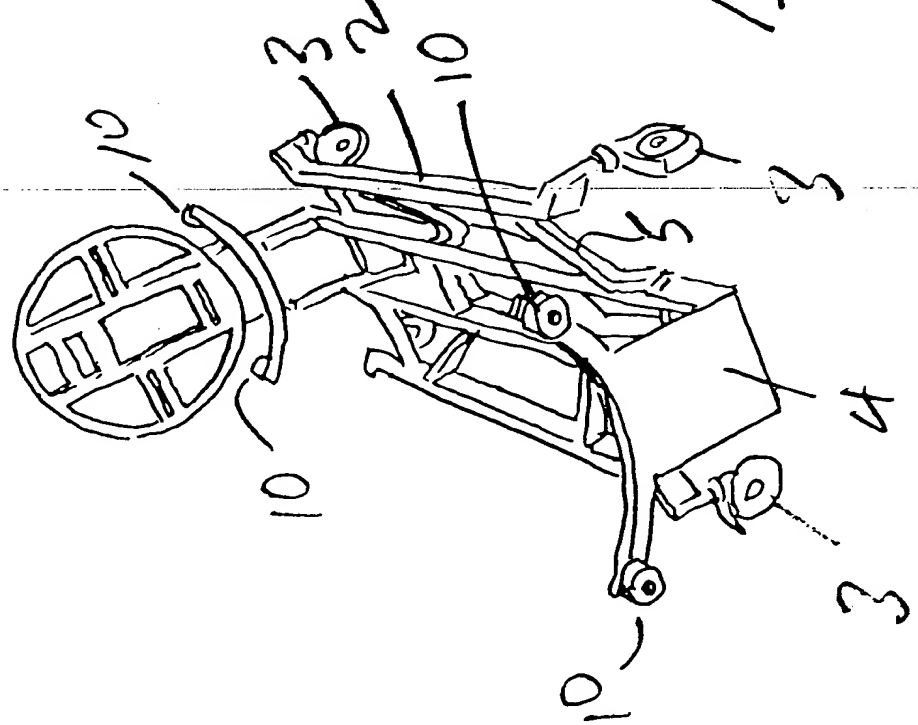


Fig 1

Fig 2



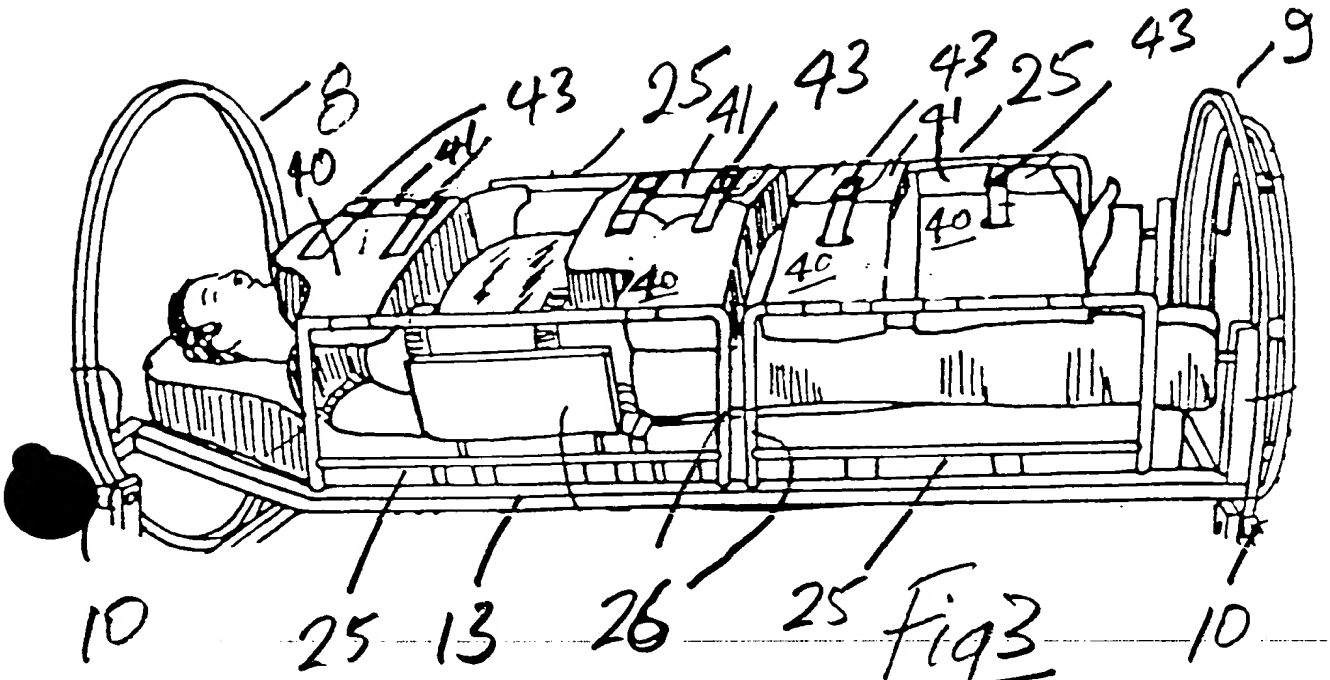

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Fig3

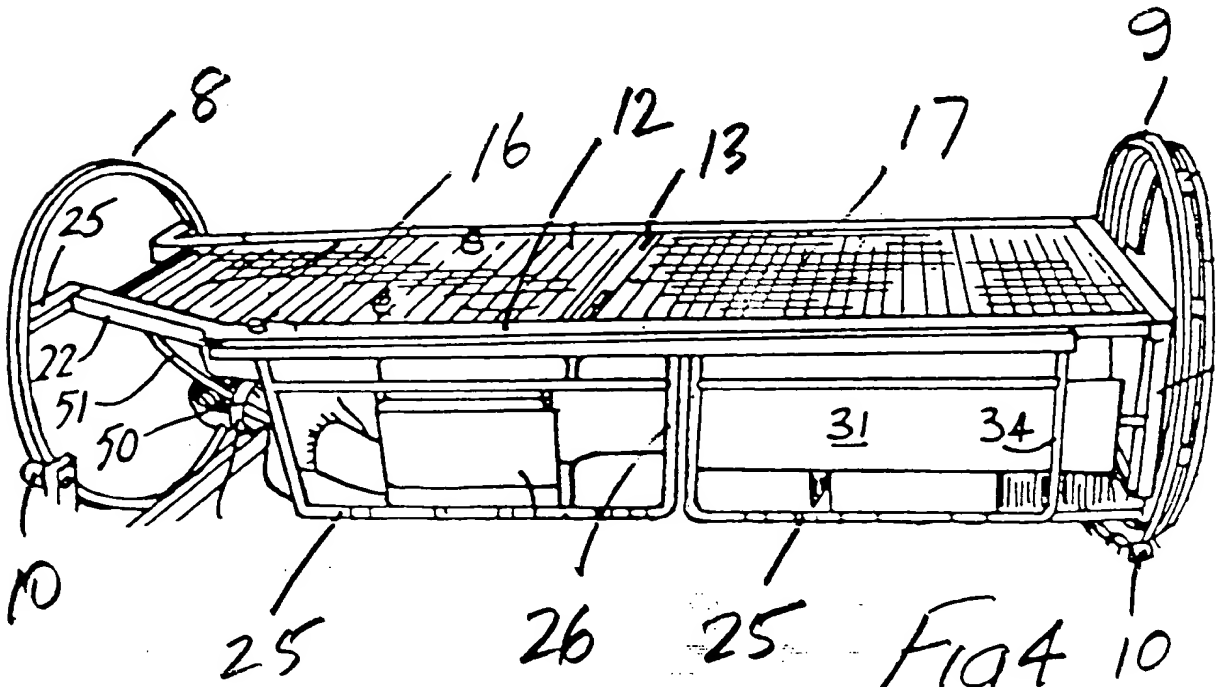
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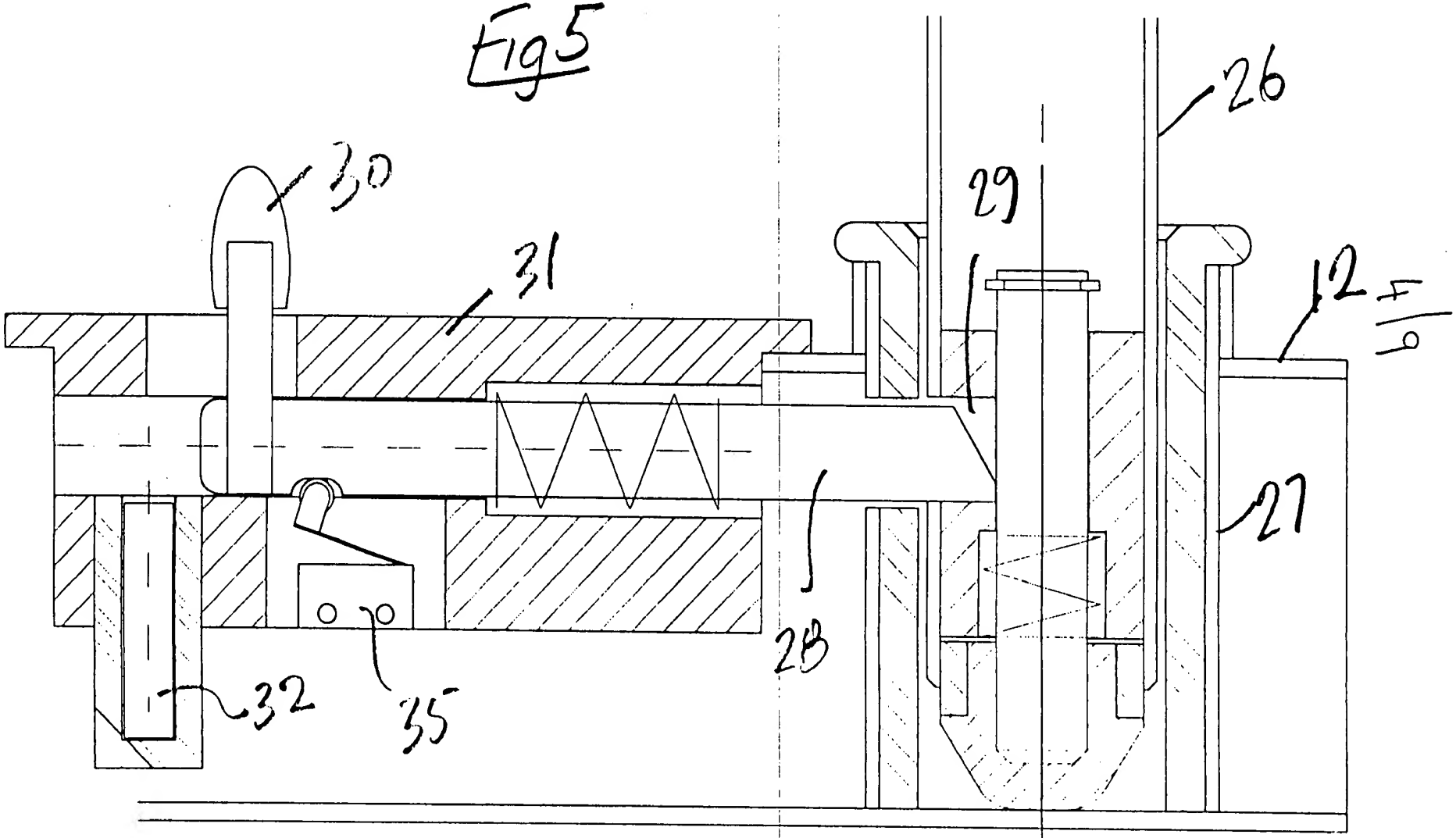
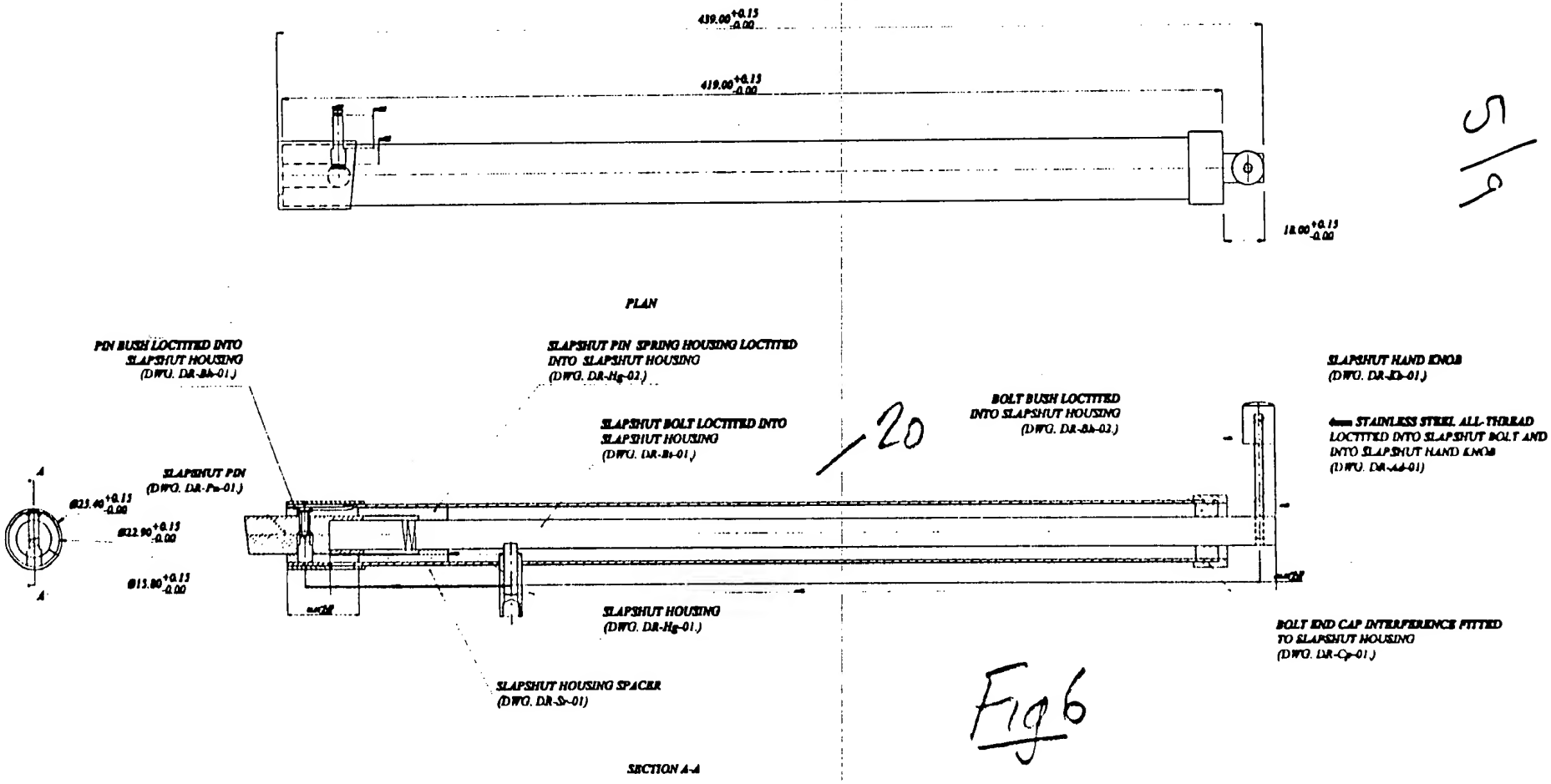
Fig4

SIDE CATCH
WITH SIDE RAIL
IN PLACE

Fig 5




439.00 +0.15 -0.00
419.00 +0.15 -0.00
18.00 +0.15 -0.00
PLAN
PIN BUSH LOCTITED INTO SLAPSHUT HOUSING (DWG. DR-Bh-01.)
SLAPSHUT PIN SPRING HOUSING LOCTITED INTO SLAPSHUT HOUSING (DWG. DR-Hg-02.)
SLAPSHUT HAND KNOB (DWG. DR-Kb-01.)
BOLT BUSH LOCTITED INTO SLAPSHUT HOUSING (DWG. DR-Bh-02.)
SLAPSHUT BOLT LOCTITED INTO SLAPSHUT HOUSING (DWG. DR-Bt-01.)
6mm STAINLESS STEEL ALL-THREAD LOCTITED INTO SLAPSHUT BOLT AND INTO SLAPSHUT HAND KNOB (DWG. DR-As-01)
SLAPSHUT PIN (DWG. DR-Pn-01.)
Ø23.40 +0.15 -0.00
Ø22.90 +0.15 -0.00
Ø15.80 +0.15 -0.00
SLAPSHUT HOUSING (DWG. DR-Hg-01.)
BOLT END CAP INTERFERENCE FITTED TO SLAPSHUT HOUSING (DWG. DR-Cp-01.)
SLAPSHUT HOUSING SPACER (DWG. DR-Sh-01)
SECTION A-A

5/9

/20

Fig 6

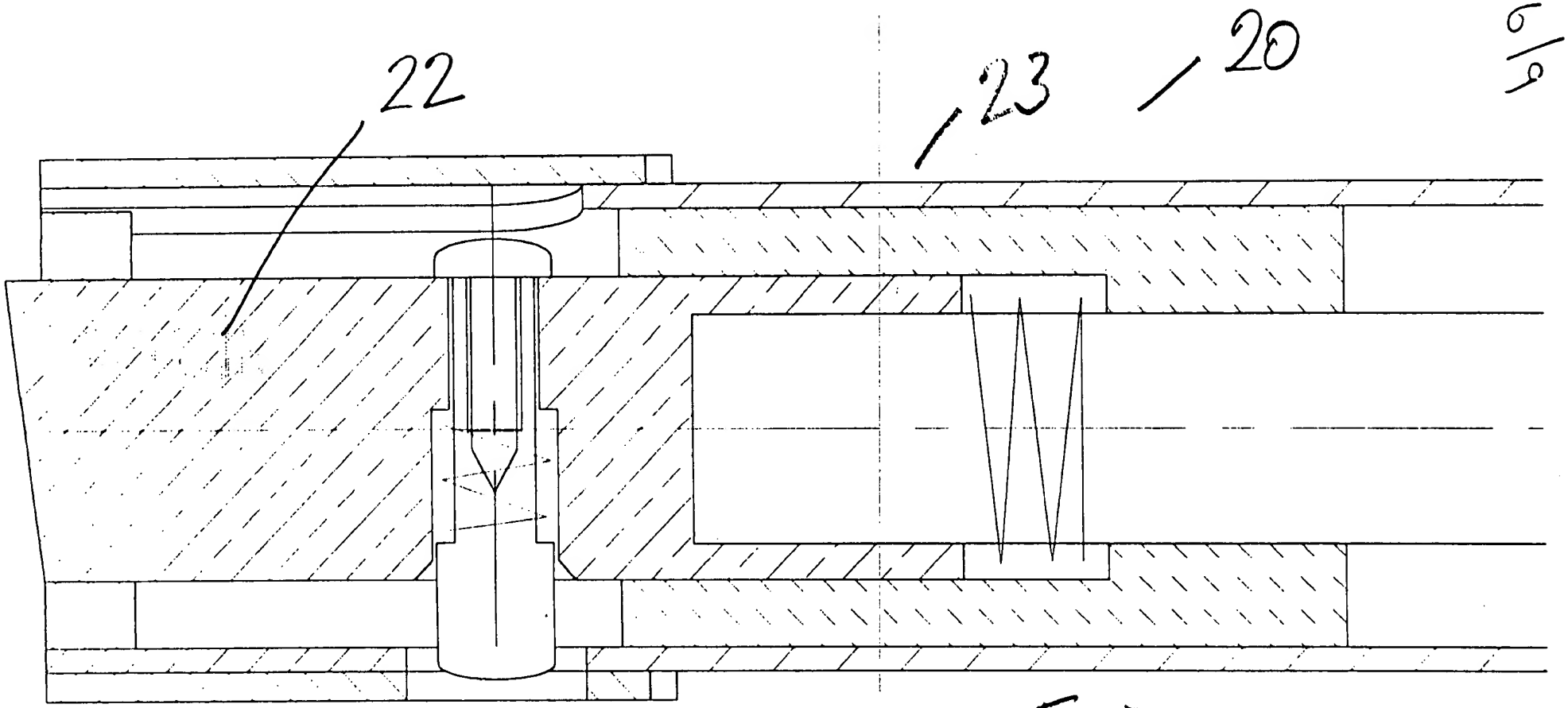


Fig 7

EXTENDED

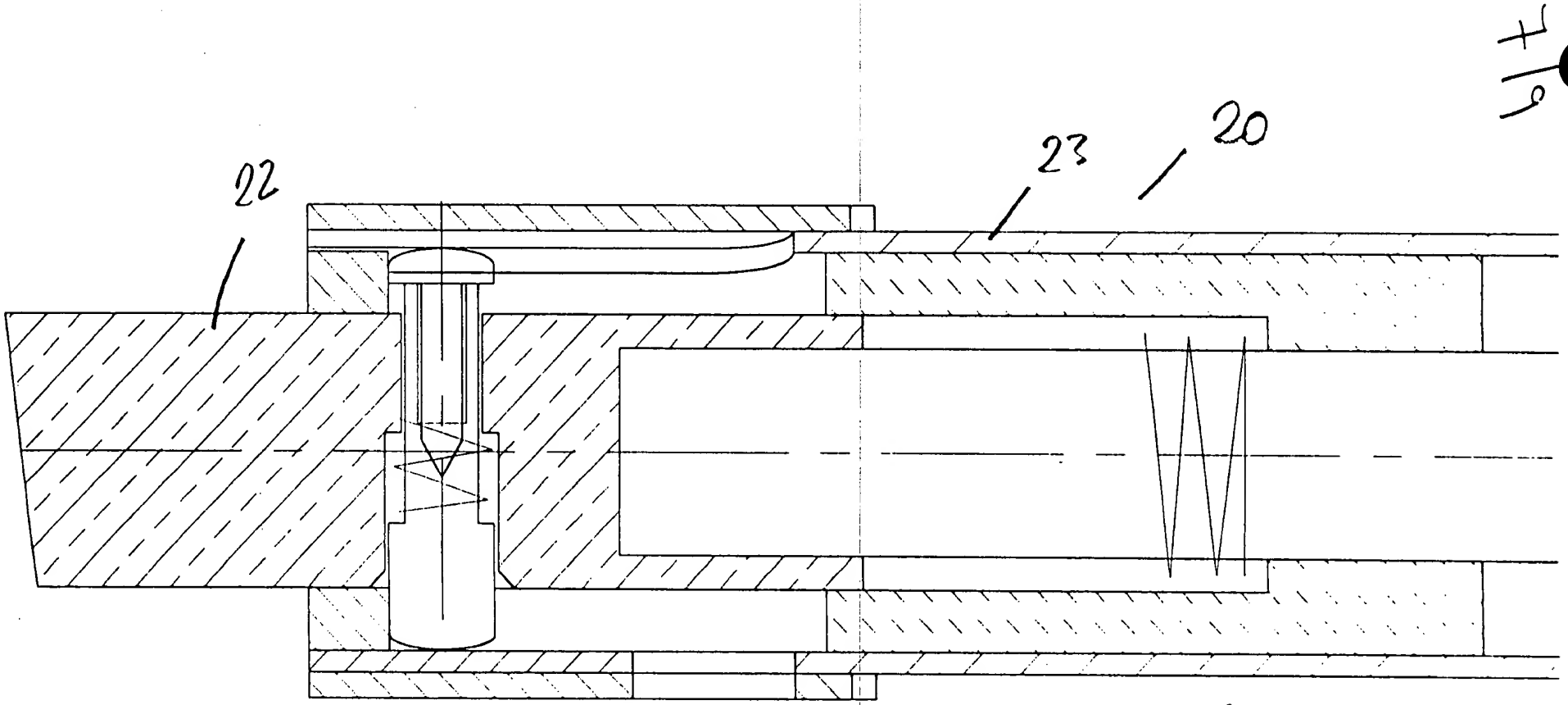


Fig8

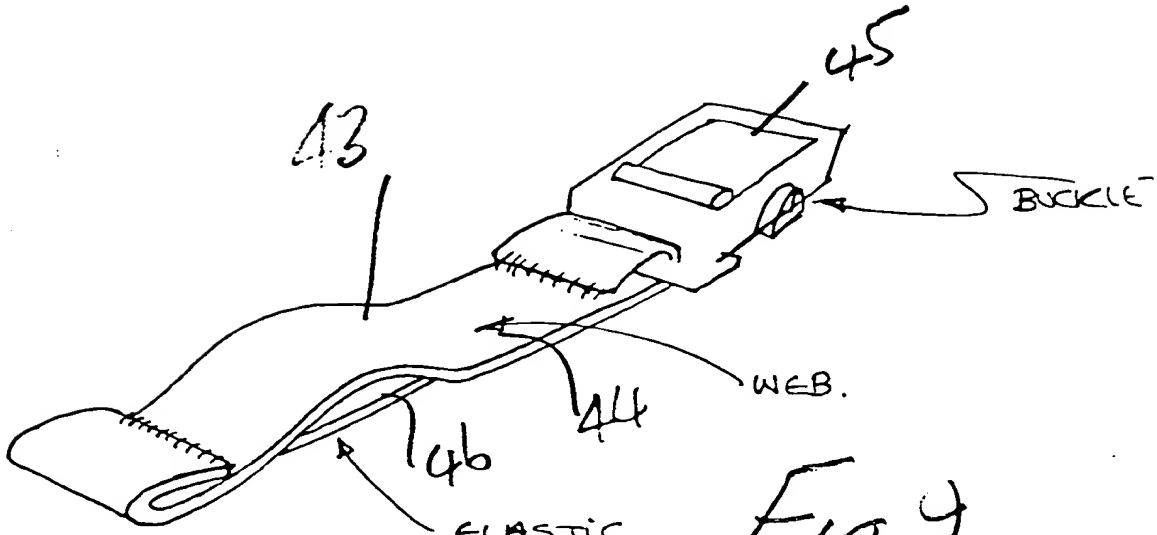


Fig 9

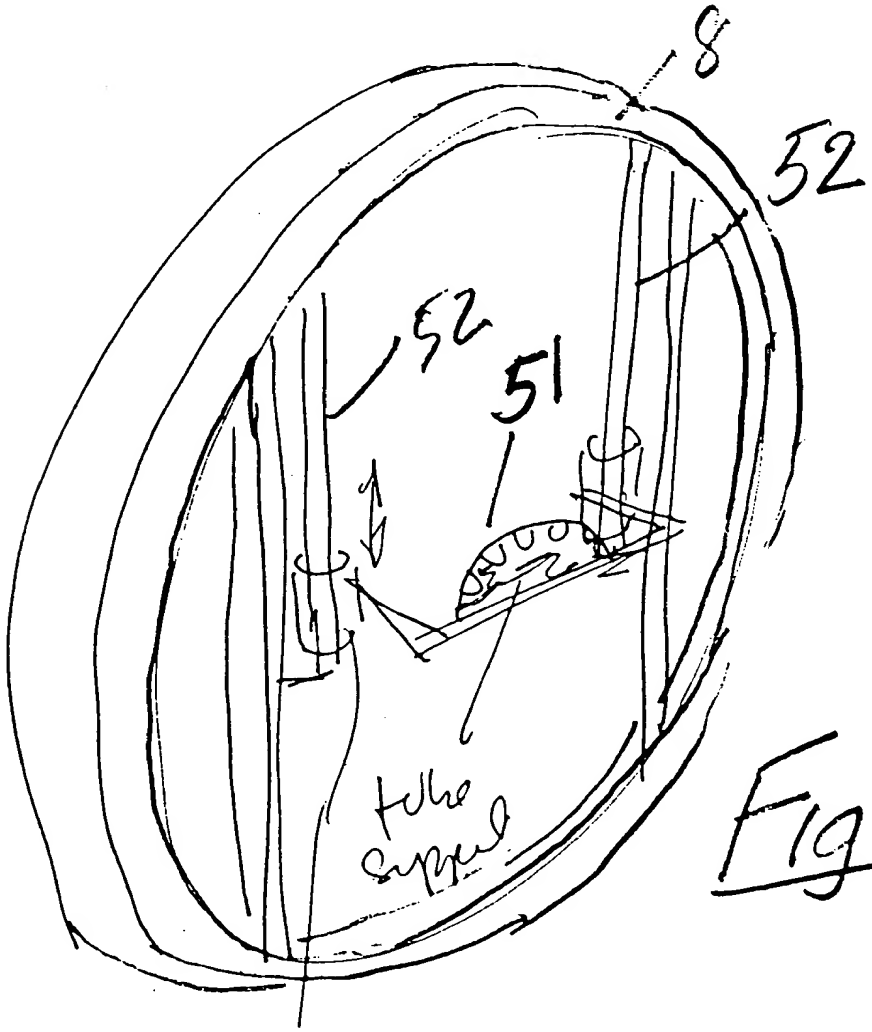


Fig 10

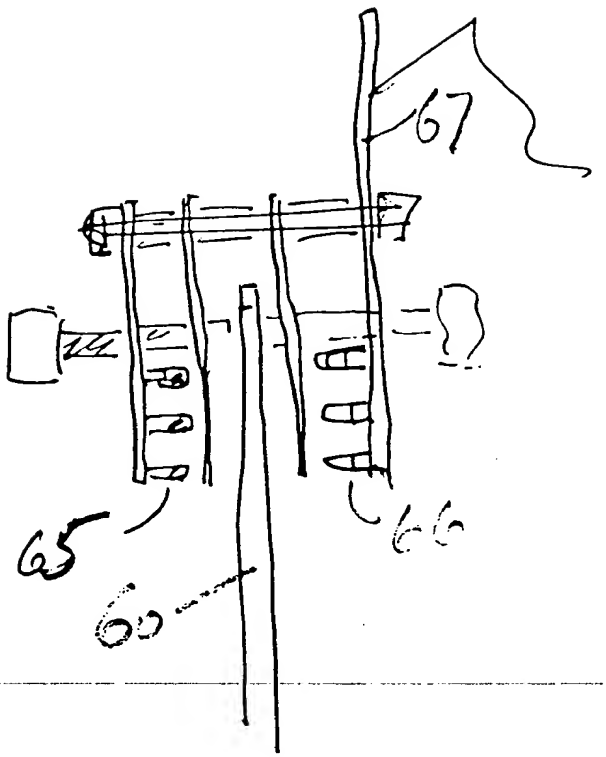


Fig 11

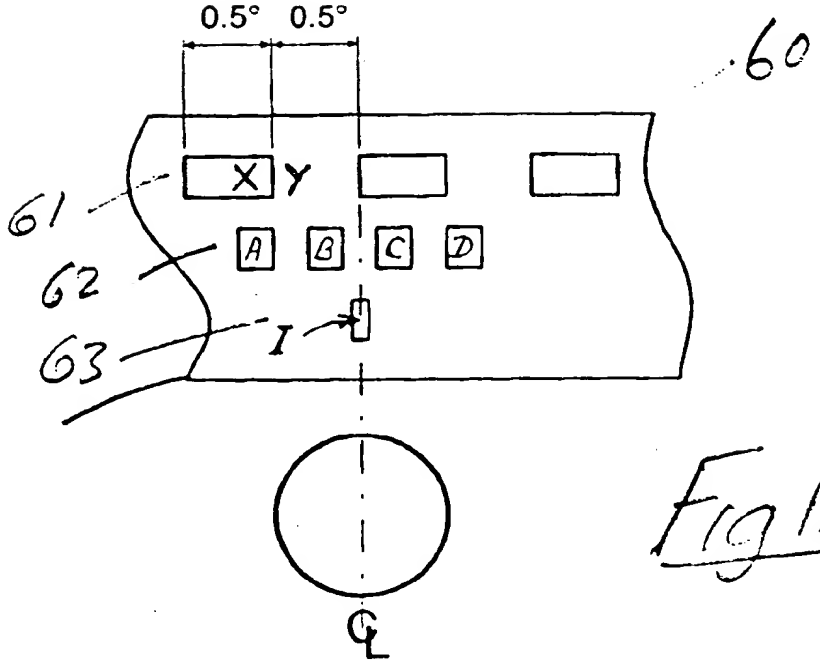


Fig 12